eighteen inches may be too little; but here an assured minimum of ten, or even eight inches, would rob farming of all its terrors.

S. E. Moffett.

Kingsburg, Fresno county, Cal., Jan. 13.

The use of slips in scientific correspondence

To find that different workers have independently reached the same conclusions, or that they have adopted the same expedients to facilitate their work, is an evidence of the justness of the conclusions, or the excellence of the expedients. This reflection is suggested by the perusal of Professor Wilder's note of above title in *Science* of 16th inst., p. 44. At the time (May 15, 1867) when Professor Wilder announced to the Boston society of natural history his use of slip-notes, I remarked that I had used slips in a similar manner; and now I can say that my principal colleague in the editorship of *Psyche*, Dr. George Dimmock, has for a long time exchanged with me, and probably with others, correspondence-slips for purposes similar to those described by Professor Wilder, and that I have used the card-catalogue system with profit for all the purposes mentioned by Professor Wilder and for others.

The essential features of slip-systems for filing away notes are the use of a standard or uniform size of paper for all purposes, and the entry of but one subject on a slip. After many and various experiments in the attempt to combine these features with others which are desirable, I have found the following arrangement the most convenient for all files which are not kept as card-catalogues purely. I procure thin manila sheets, 23 by 15 centimetres, or about 9 by 6 inches, which are perforated with a cutting-punch near the left margin, at distances of 13.5 centimetres from the right margin, and 2.5, 7.5, 16, and 21 centimetres from the lower edge.[1] Any number of these can be bound together by shaking them into place, and passing a twine or thread through the perforations, which all correspond. Slips, of whatever size or shape, not exceeding 23 by 13.5 centimetres in size, can be lightly attached to the right-hand pages by mucilage on two or more corners of the slip. These can be extended, rewritten, or removed, without removing the sheets to which they are attached. The whole of the left-hand page serves for catch-words, classificatory headings and sub-headings, or whatever matter of similar character may be desired, referring to the reverse of the page. New leaves can be inserted, or old ones removed; in a short time, while at all times the notes have the advantage of being in book form, and free from the dangers of accidental displacement, as, for instance, by a gust of wind, or by dropping the package. For rapidity and ease of reference, I know of no better system. The removal of slips from envelopes, and replacing them, take a great deal of time; and the keeping of slips in card-catalogue form prevents a rapid survey of the material in hand. If it is desired to spread the whole material out on one surface, the strings can be withdrawn from the leaves.

The same manila sheets can be used for mounting newspaper scraps for permanent preservation; and pamphlets, circulars, etc., can be perforated with corresponding holes, so that all may be tied together in any sequence desired, and temporary covers, similarly perforated, may be placed on each brochure.

B. Pickman Mann.

Washington, D.C., Jan. 19, 1885.

[1] For an article by me on standard holes for temporary binding, see *Library journal*, January, 1883, vol. viii. pp. 6, 7.

THE DECADENCE OF SCIENCE ABOUT BOSTON.

A Bostonian, proud of the scientific fame of his native place, and yet only too familiar with empty benches at the ordinary scientific assemblages, and to whom the election of new members, 'postponed for want of a quorum,' is a standard event, when he visits Baltimore and Washington, begins to ask whether the sceptre has not departed from Israel. He is thereafter a little shy about inviting a brother physicist from Baltimore to attend a meeting of the academy, or taking a naturalist from Washington into a session of the natural history society. To a friend about to visit the national capital, he unburdens himself with sad forebodings of the decadence of science at home; but 'tell it not in Gath,' he whispers as he parts. Nevertheless, it is an open secret.

The actual state of things is simply this, — that the meetings of scientific societies at Washington and at Baltimore are much more numerous and more specialized than at Boston and Cambridge, and present at nearly every session a more varied and interesting assortment of papers, which receive wider and freer discussion at the hands of much larger audiences. So far as interest and attendance go, the meeting in the southern city is what it formerly was in the northern; and it is a pleasant and yet sad reminiscence of earlier and better days for a scientific man from Massachusetts to visit his confreres at the south. He sees again the freshness and eagerness he was wont to see at home. The audience does not sit around the rear door, hat in hand.

It is not easy to see the exact reason for all this changed aspect of affairs in the north. Assuredly, never was more expected of science than at the present day. All men attend her words. Is it that each specialist has become so engrossed in the little corner of the universe he cultivates that he can scarcely see beyond that corner, and must needs keep to it even when he shows its products? Yet why should one's mental horizon be narrower at Boston

than at Washington, at Cambridge than at Baltimore? The only way we can account for this is in the undoubtedly freer social life at the south, by which men are brought into more frequent collision, with consequent interchange of ideas; and this would lead one to conjecture, that, unless manners change, Boston and Cambridge cannot regain pre-eminence.

It is all very well to say with a complacent air that science does not depend on the public, and that her great discoveries are made far from the noisy world. It is only in exceedingly rare instances that they have been made by men whose scientific ardor was not born of contact with living teachers. And men who seek wisdom for themselves alone defraud the public; especially in these latter days, when it is this very public that is to furnish their successors in the investigation of nature. The public covets no man's scientific gold or apparel, but has a not altogether unwholesome yearning for a sight of it; and it is a travesty of the scientific spirit to keep it from view. Science may be a mild hermit: she can never be a miser.

But to return to Boston. The decadence noticed within the last ten years cannot be attributed to any change of general manners in the modern 'Athenian,' but must be sought in other local causes, and may be largely apparent. The increasing proportion of scientific men residing outside of Boston itself has much to do, during the colder and stormier season, with the small attendance at meetings which it takes an hour's travel to reach; and yet it is rare to find at any scientific gathering in Boston, even if it be an attractive feast, any less proportion than one-half from Cambridge. The university, too, makes larger and larger demands upon its servants; and the extraneous attractions of Cambridge itself, not to mention those of Boston, absorb more and more the time and strength of those who were wont in former years to add to the interest of the scientific meetings in Boston. Their example is followed by their juniors, and Boston itself fails to make good its own loss.

THE GEOLOGY OF THE SCOTTISH HIGHLANDS.

THE geology of the Highlands of Scotland has a peculiar interest for American students, first, because that region has many resemblances, both stratigraphical and lithological, to parts of eastern North America; and, second, because therein the same great questions which have been raised and settled with regard to New-England rocks, have there also been debated and finally solved, with similar results. There is in north-western Scotland an ancient gneissic series, which the present writer, in 1855, pointed out as the equivalent of our older gneiss, as seen in the Laurentides and the Adirondacks. Resting upon this Laurentian or Hebridean gneiss in Scotland, there is found to the east a group of quartzites and limestones containing a lower paleozoic fauna, in part, at least, Cambrian in age; while apparently overlying these fossiliferous rocks, on their eastern side, is a great series of gneisses and mica schists, rising into hills which form the western Highlands, extending south and east, and covering an area of at least fifteen thousand square miles. This whole region was studied a quarter of a century since by Murchison, aided by Ramsay and Harkness, and later by A. Geikie; and in 1858 and 1860 it was declared by Murchison that the gneisses and mica schists of the Highlands were newer than the fossiliferous strata, and were, in fact, rocks of Silurian age in an altered or metamorphic condition. As I pointed out in 1860, the parallelism between these Scottish rocks and those of New England and eastern Canada is evident. The ancient gneiss of the Adirondacks, the paleozoic strata of the Champlain basin, and the crystalline schists of the New-England Highlands, then regarded by most American geologists as of paleozoic age, are a counterpart of the strata of north-western Scotland, and I am aware that Murchison was sustained by these resemblances in his view of the age of the Scottish Highlands. It was, however, then opposed by Nicol, who maintained that these rocks, though distinct from those of the west coast, were, nevertheless, more ancient than the fossiliferous Cambrian found along their western base. I at that time shared the common belief of the metamorphic school of American geologists, and, extending it to the Scottish rocks. supported the thesis of Murchison and his colleagues against that of Nicol. When, however, I became satisfied of the errors of this school, and asserted the pre-Cambrian age of the various